

Chapter 4-9

Sewerage Systems

Abstract

Lake Biwa located around the center of Shiga Prefecture, of which basin is covered by 4 regional sewerage systems and 6 public sewerage systems. These sewerage systems are designed to cover 98% of the population of Shiga Prefecture.

Keywords: Advanced treatment, Effective use of sewerage resources, Urban storm-water runoff control

1. Advanced Treatment of Wastewater

To conserve the water quality of Lake Biwa, at all of the wastewater treatment plants (WWTPs) of both regional sewerage systems and public sewerage systems in the prefecture, advanced treatment is implemented to remove nutrients such as nitrogen and phosphorous in addition to the treatment focused on organic matter.

2. Introduction of Effective Advanced Treatment Methods

To meet environmental standards for water quality of Lake Biwa, phased reconstruction and upgrading of the treatment plants of the regional sewerage system is underway to realize more effective, high-level treatment.

The latest wastewater treatment method which employs advanced treatment through the step-feed multi-stage biological nitrogen removal process enables higher-level advanced treatment at similar costs to the nitrified liquor recycle single-sludge nitrification process used by past and present advanced treatment methods. In the Lake Biwa regional sewerage system, a post-denitrification tank is added to this system to meet the higher requirement of the effluent.

3. Effective Use of Sewerage Resources

To realize a recycling society and reducing greenhouse gases that cause global warming, a sludge fuelization project has started at Kosei WWTP which produces coal-alternative fuel from sewage sludge.

Table 4-9-1 Water quality of effluent for 2012

	COD	T-N	T-P
Konan-Chubu Wastewater Treatment Plant	5.0 mg/l	4.8 mg/l	0.06 mg/l
Kosei Wastewater Treatment Plant	5.3 mg/l	3.3 mg/l	0.05 mg/l
Tohokubu Wastewater Treatment Plant	5.0 mg/l	2.0 mg/l	0.05 mg/l
Takashima Wastewater Treatment Plant	5.7 mg/l	3.9 mg/l	0.04 mg/l

4. Pollution Control of Urban Stormwater Runoff

Pollutants which accumulate in areas such as road surfaces or rooftops of buildings on urban land are washed out into Lake Biwa by rainfall. These pollutants become part of the pollutant load in the lake called "diffuse sources." It is very difficult to reduce the pollutant from diffuse sources.

In order to reduce this pollutant load from urban land, even if only to a small extent, Shiga Prefectural Government is implementing initiatives to purify wastewater from urban land from the Yamadera River basin in Kusatsu City by methods such as wetland treatment and soil filtration.

The sludge settled in Moriyama-Ritto trunk stormwater pipe is washed out into a sewer pipe after draining rainwater, and the sludge is treated at Konan-Chubu WWTP.

(Sewerage Division,
Shiga Prefectural Government)

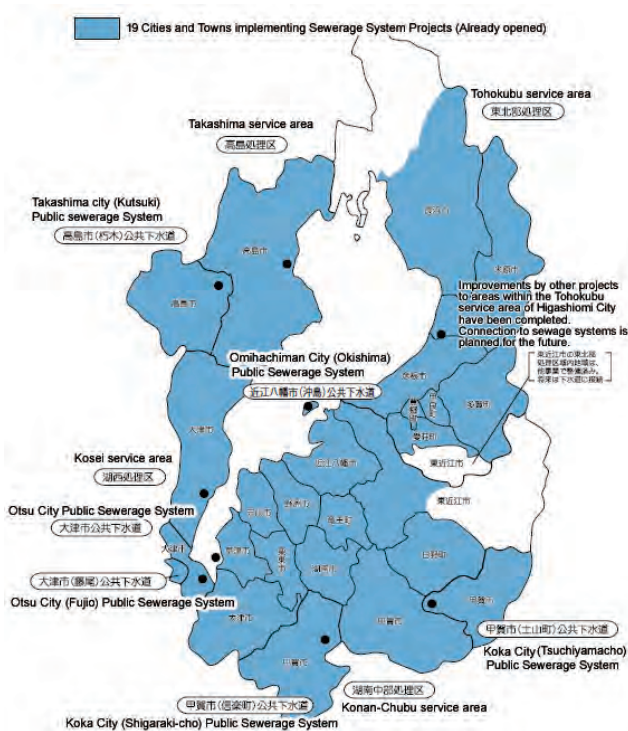


Fig. 4-9-1
Sewerage service area in Shiga Prefecture
(as of the end of FY2012)

Table 4-9-2 Overview of service area (as of the end of FY2012)

	Lake Biwa Regional Sewerage System			
	Konan-Chubu service area	Kosei service area	Tohokubu service area	Takashima service area
Service area	Approx. 17,313.7ha	Approx. 2,179.1ha	Approx. 9,225.6ha	Approx. 1,833.9ha
Service population	Approx. 700 thousand	Approx. 114 thousand	Approx. 262 thousand	Approx. 40 thousand
Average influent	241,762m ³ /Day	41,223m ³ /Day	90,762m ³ /Day	12,126m ³ /Day
Sewer system	Separate sewer system (wastewater and rainwater are treated separately.)			
Percentage of sewered population	89.9%	95.6%	78.4%	79.6%

Public Sewerage System: A sewerage system which collects wastewater from mainly households and offices with sewer pipes and is managed by the municipality. Systems which purify wastewater at the municipal WWTP are called “independent public sewerage systems” and systems which are connected to a regional system are called “regional public sewerage systems”. In principle, construction, maintenance and management of such systems is performed by each municipality.

Regional Sewerage System: A system which covers multiple towns and cities, making it possible to effectively conserve the water quality of lakes and rivers. In principle, construction, maintenance and management of trunk sewer pipes and WWTP are performed by the prefecture.